



**US Army Corps
of Engineers.**
Construction Engineering
Research Laboratory

Fact Sheet

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ANIMAL ACTIVITY: INSTRUMENTATION FOR REMOTE MONITORING

The Problem

Under the Endangered Species Act (ESA), the U.S. Fish and Wildlife Service can issue management recommendations to ensure survival of endangered species. Insufficient impact data may prompt conservative recommendations that place constraints on military activities. This creates an urgent need for impact assessments. Current assessment methodology is typically field observations by trained biologists. This approach provides accurate information, but is expensive and can result in a limited statistical sample, and the observer's presence may affect the animals' behavior. Improved remote sensing technology could help economically and accurately assess the baseline activity of animals and impacts of military training on their behavior.

The Technology

The U.S. Army Construction Engineering Research Laboratory (CERL) is developing means to monitor animal activity remotely. Telemetry is a standard wildlife study technique in which a radio receiver and directional antenna are used to locate an animal previously fitted with a miniature radio transmitter. We are extending the use of telemetry in a new way to measure animal activity. Since virtually any movement of the animal causes changes in the signal, a recording of the signal can be viewed as a record of movement. Signal characteristics of potential utility include amplitude, frequency, and polarization. Depending upon circumstances and the study species, it may be possible to discern such activities as flight, perching, foraging, resting, nest attendance. The use of a frequency agile receiver and data logger allows the signal from several animals to be sampled and recorded simultaneously. This data could be displayed real-time on a computer screen or logged for later analysis. The resulting activity histograms are amenable to automated computer analysis.

Benefits/Savings

This research will provide a methodology that will infer animal activity from temporal records of received telemetry signals. The findings from this approach will compliment and augment traditional field observation by enabling one person to study the activity of many animals continuously for a protracted period of time in any weather. Remote monitoring is also useful for studies in inaccessible or dangerous areas and to avoid intrusive impact of direct observations by humans. Automated signal processing techniques can greatly enhance the objectivity and replicability of field study results and will also reduce the time and effort required to gather and to analyze data. The findings provided by this research effort will facilitate environmental impact assessments and the data acquisition necessary to comply with requirements of Army resource management objectives. Benefits include reduced losses of military training capability, reduced need to purchase additional training land, and preservation of natural resources.

Status

Basic research is continuing and has demonstrated the potential of the technology. The research will transfer to applied research in FY99-00 for further development of automated data analysis techniques and for development of equipment. Some of the techniques developed in the basic research can be and have been put into practice in other research areas such as automated data analysis algorithms and specialized radio reception field units.

Point of Contact

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